

# New Large Diameter RF Complex Plasma Device

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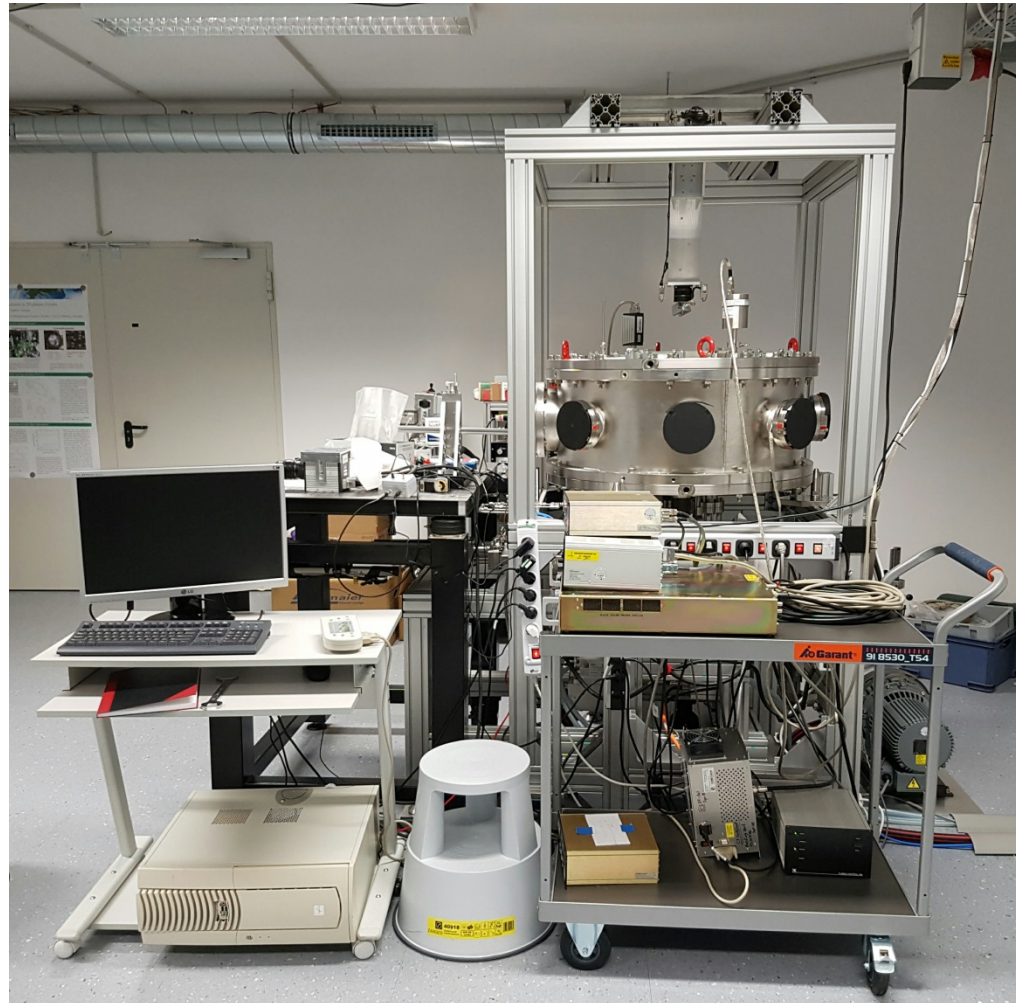
Special thanks to:  
Vladimir Nosenko, Hubertus Thomas



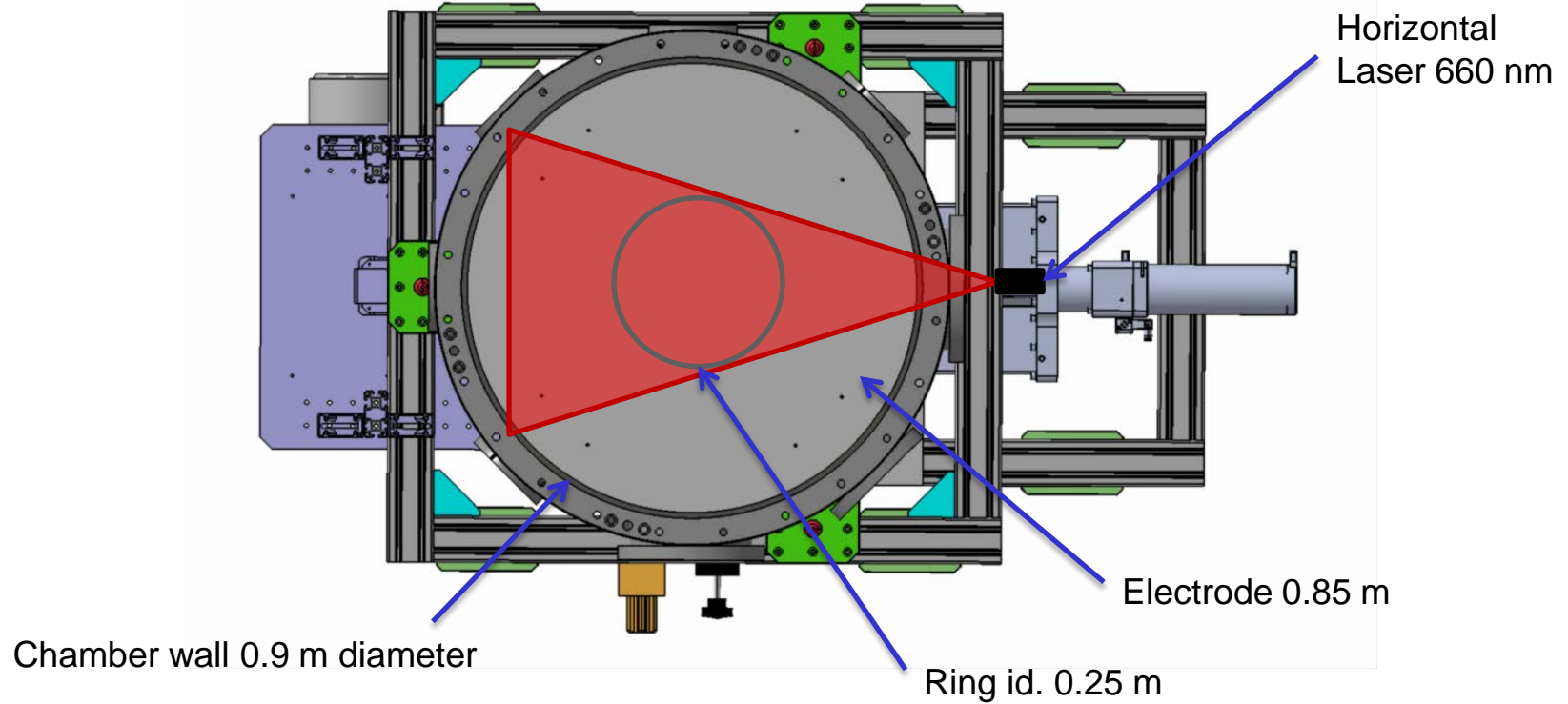
Knowledge for Tomorrow



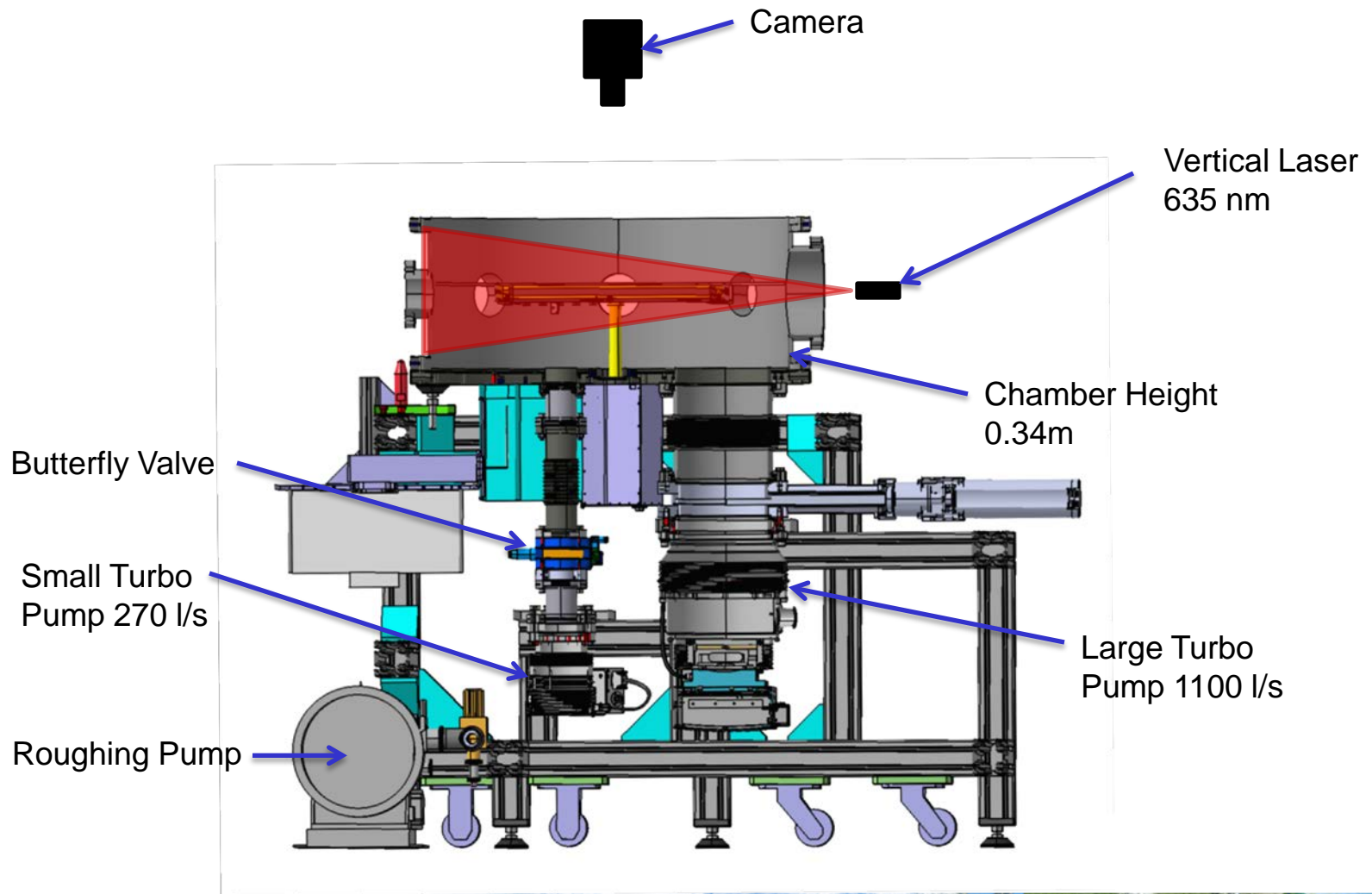
# Large Chamber Setup at DLR



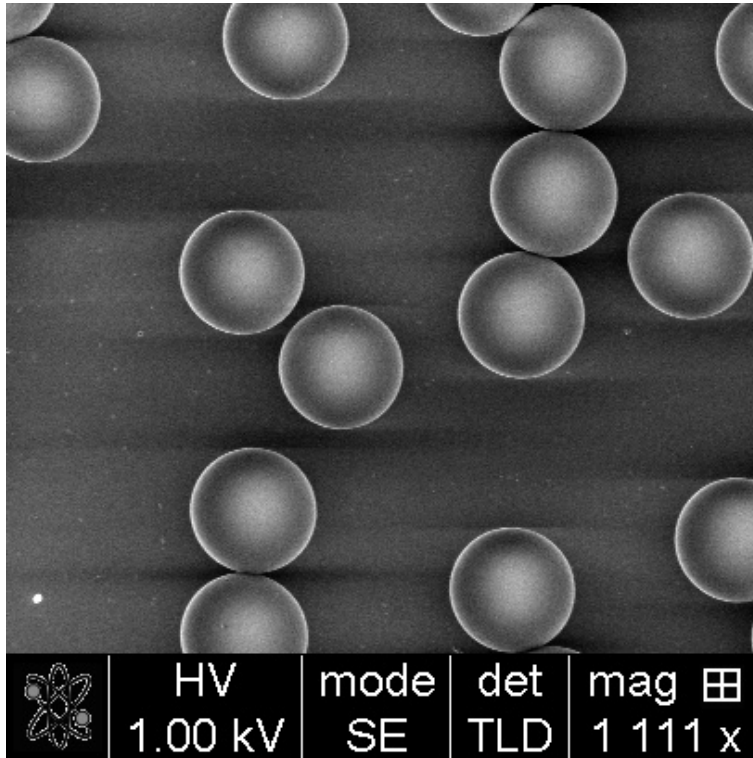
# Setup Diagram







# Experimental Parameters



## Polymer (MF) microspheres:

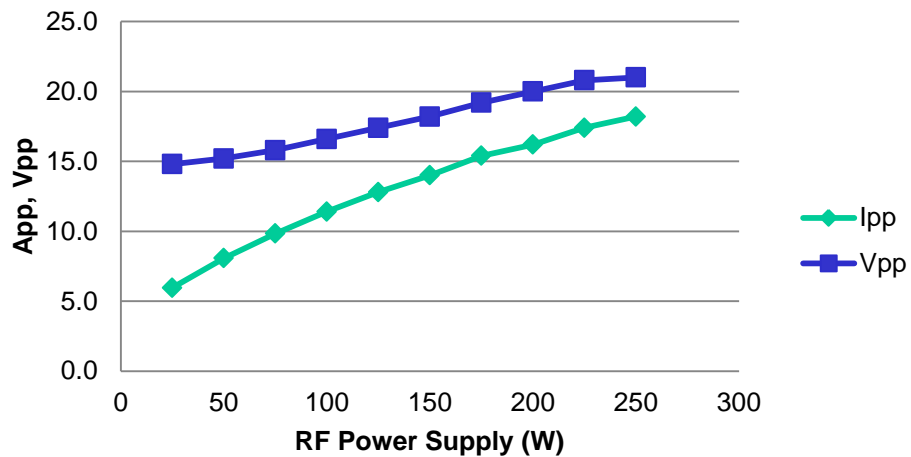
Diameter	$d \approx 9 \mu\text{m}$
Charge	$Q \approx -2 \cdot 10^4 e$
Spacing	$a \approx 0.9\text{-}1.6 \text{ mm}$
Number	$\approx 14,000$

## Argon RF plasma:

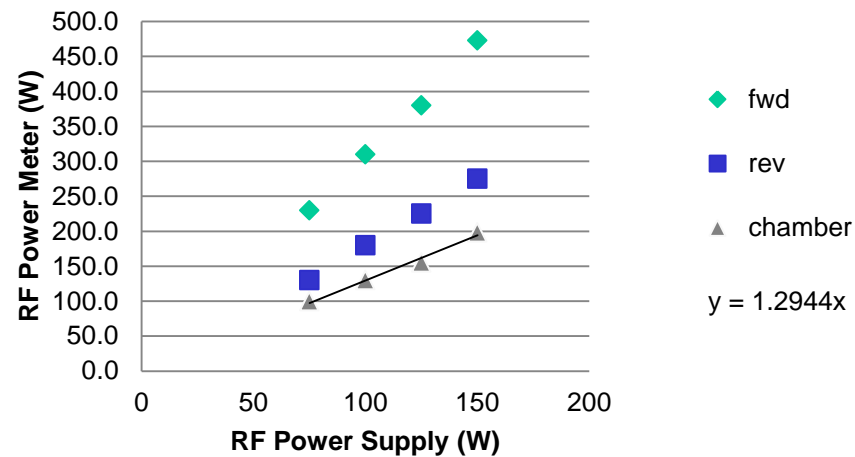
pressure	2.50-5.00 Pa
RF power	100-420 W
Self Bias	-10- -40 V



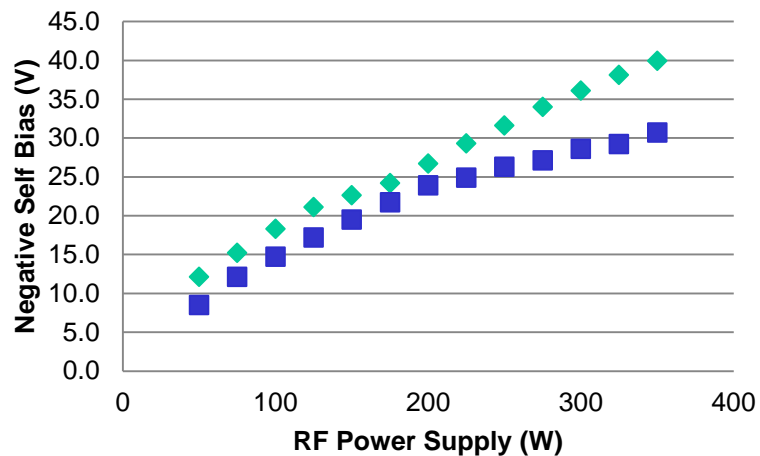
## Electrode Current and Voltage



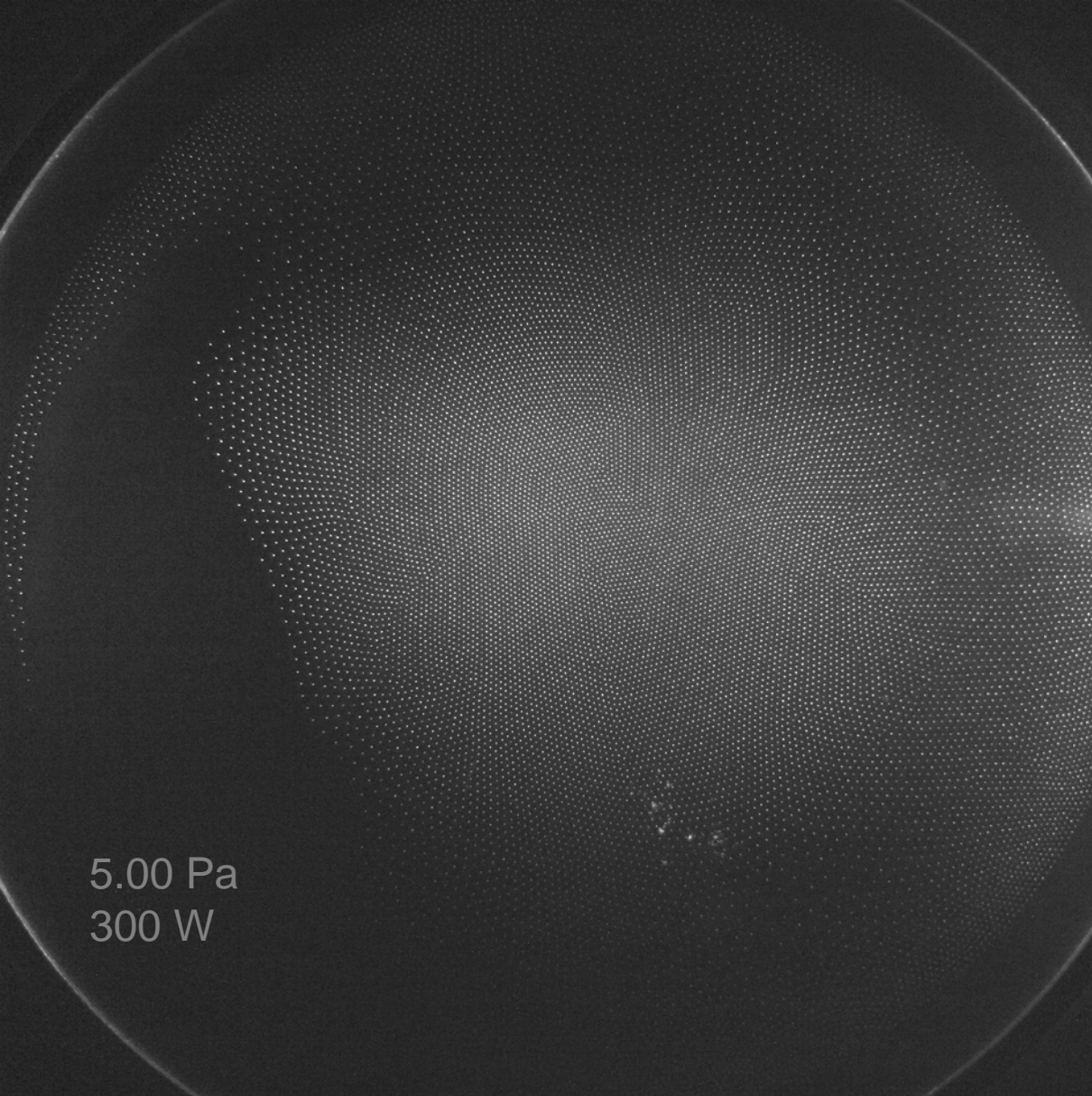
## Chamber Power vs Input



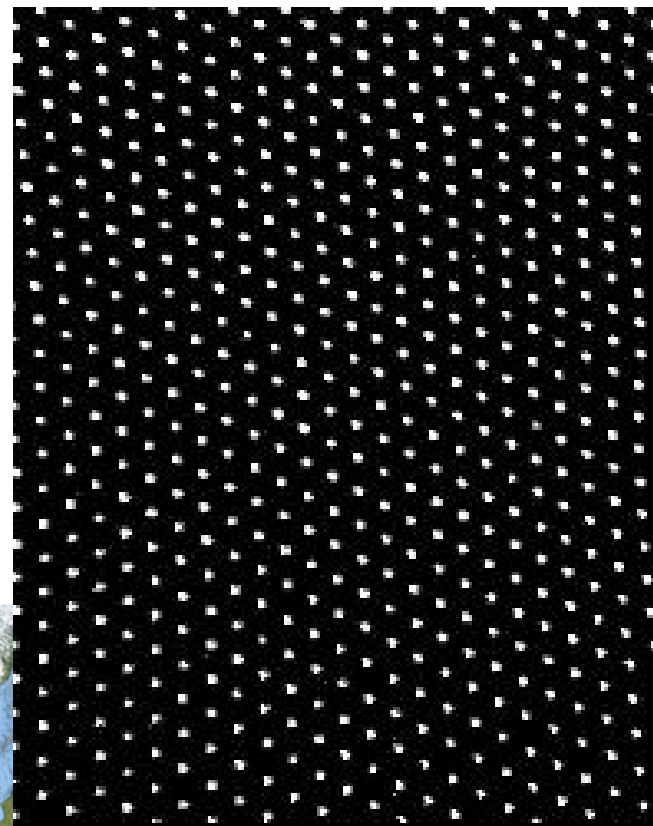
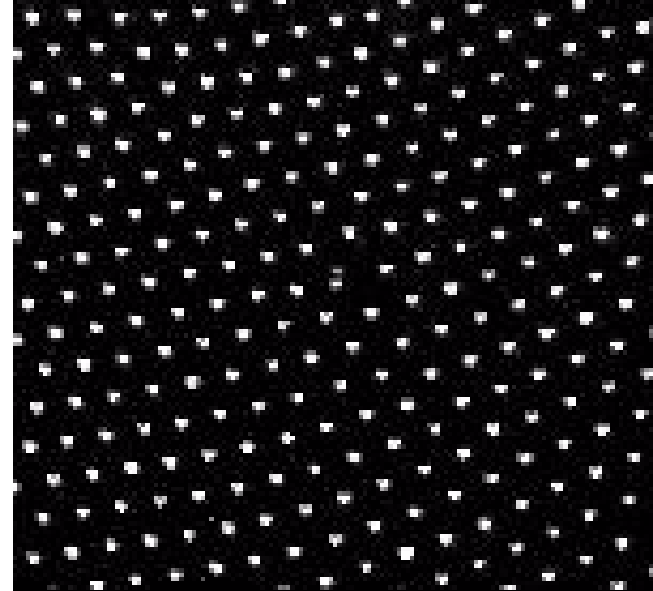
## Self Bias







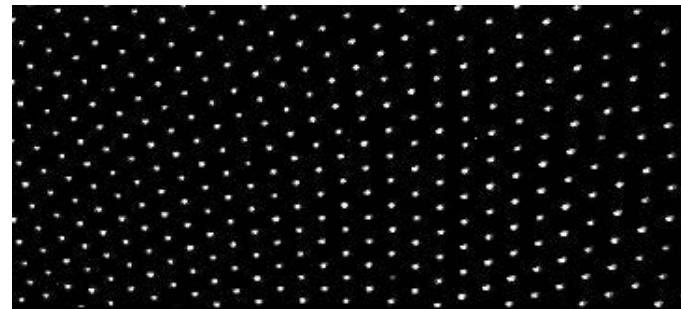
5.00 Pa  
300 W



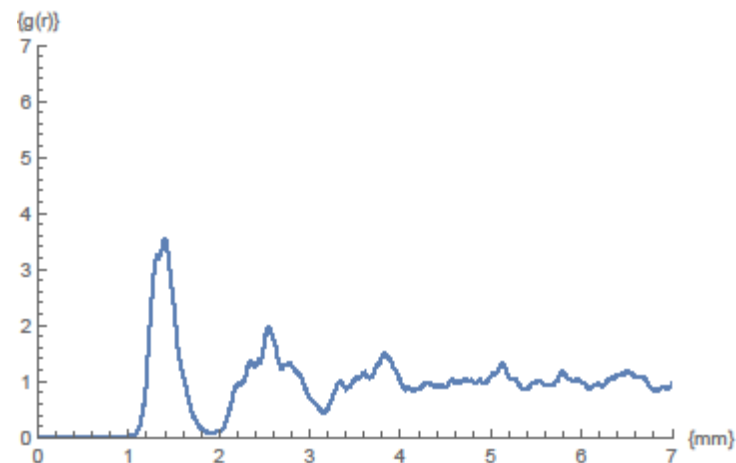
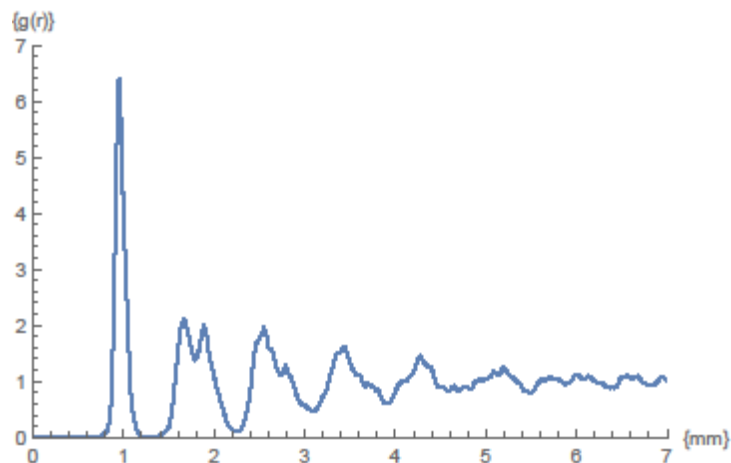




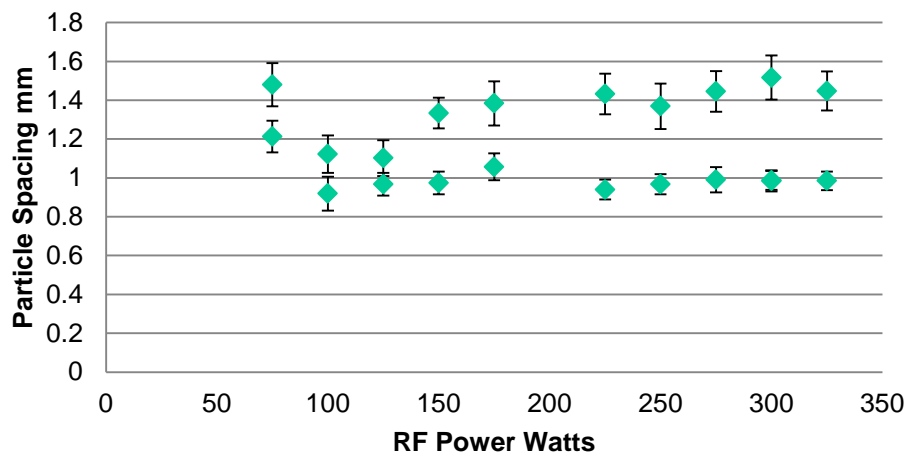
2.75 Pa  
200 W



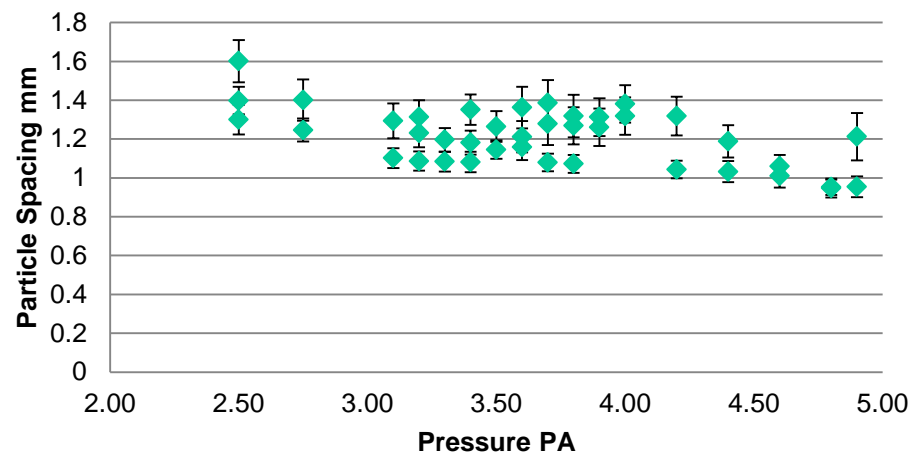




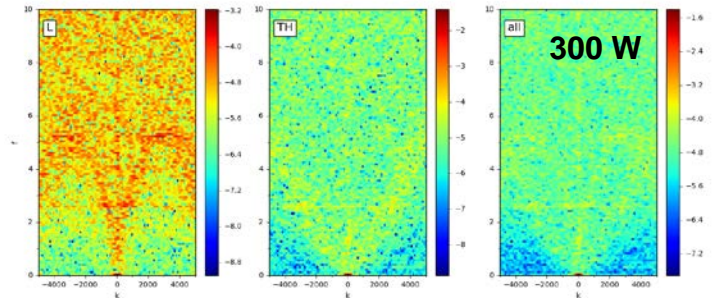
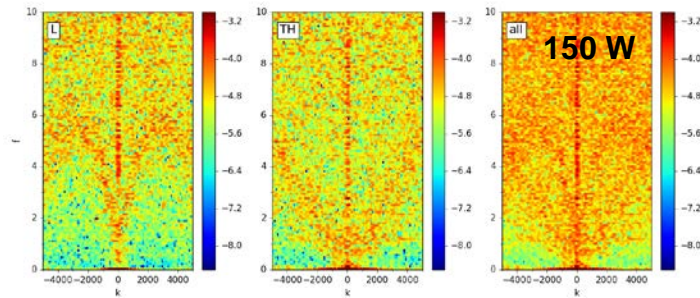
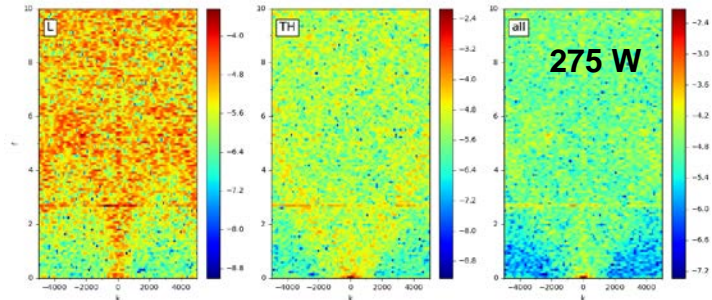
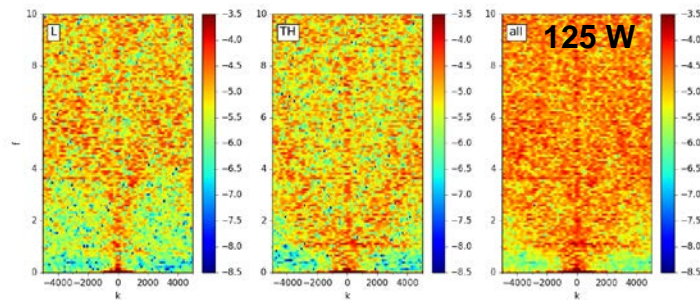
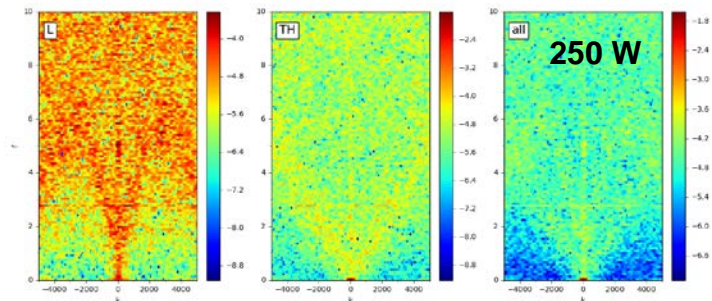
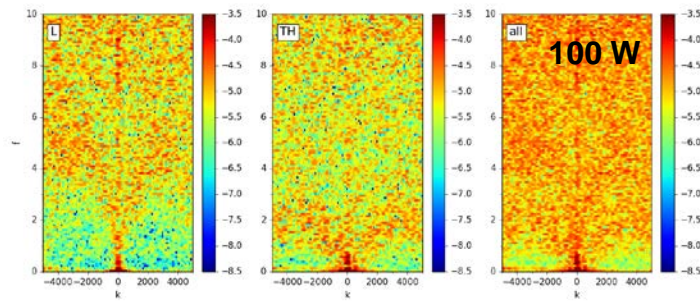
### Particle Spacing vs Power



### Particle Spacing vs Pressure



# Sample Spectra at Powers



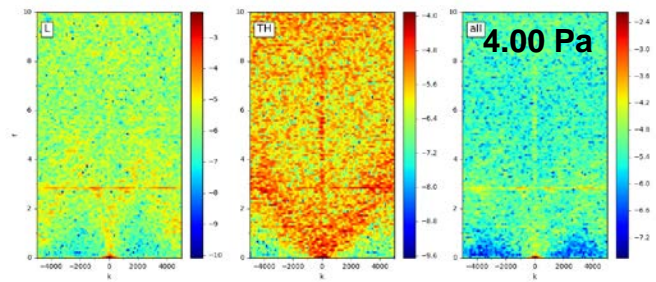
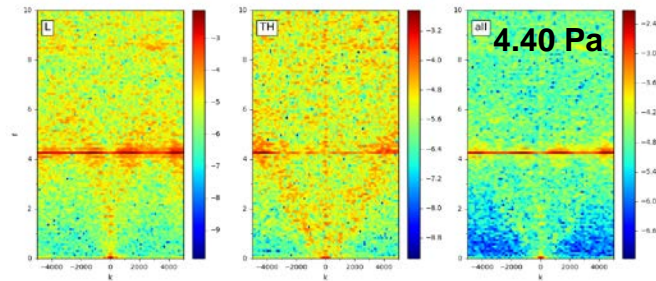
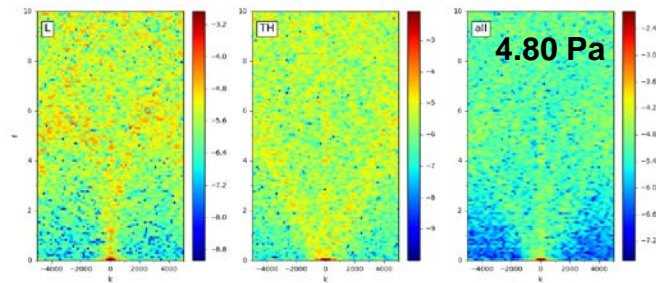
Longitudinal Transverse Together

Longitudinal Transverse Together

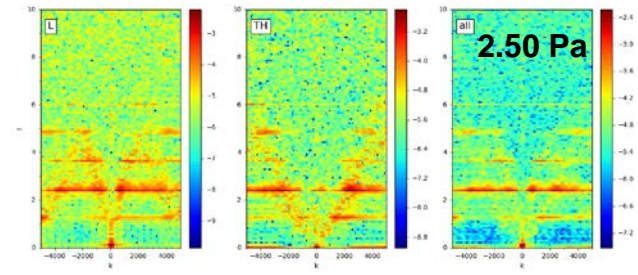
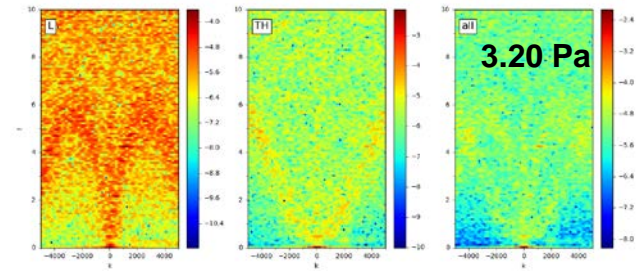
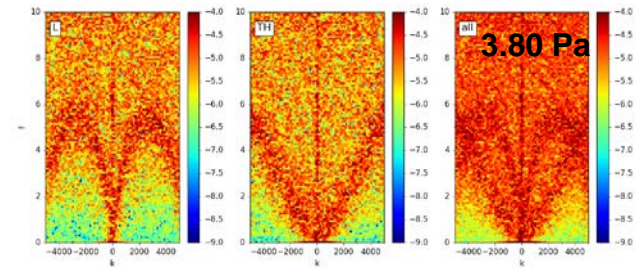




# Sample Spectra at Pressures



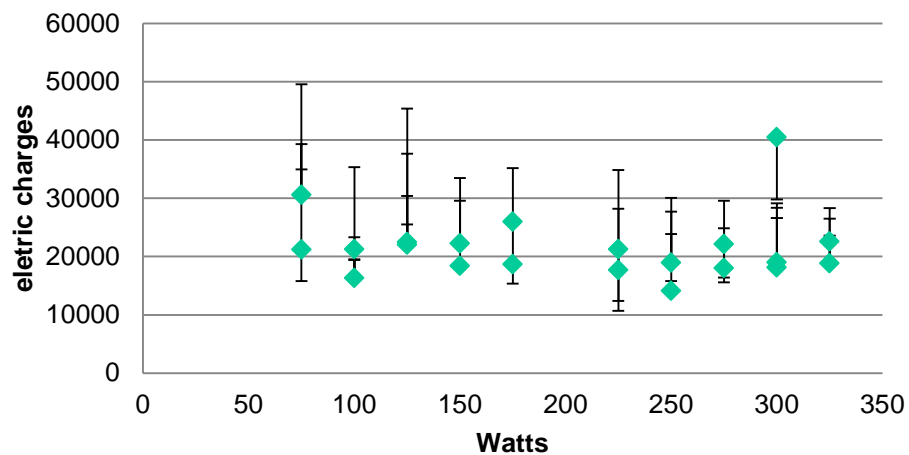
Longitudinal Transverse Together



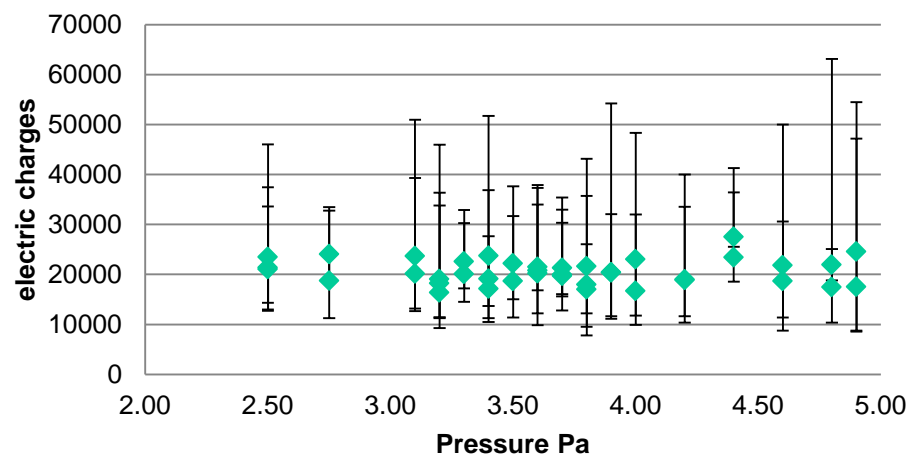
Longitudinal Transverse Together



### Q vs Power

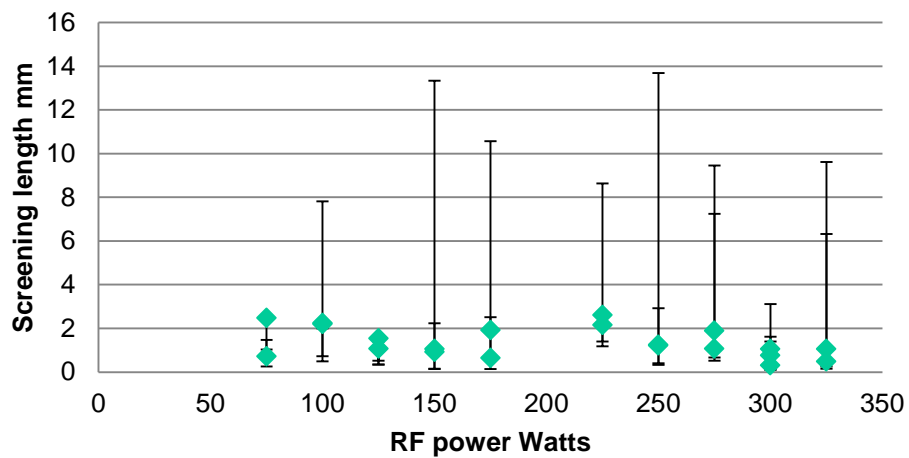


### Q vs Pressure

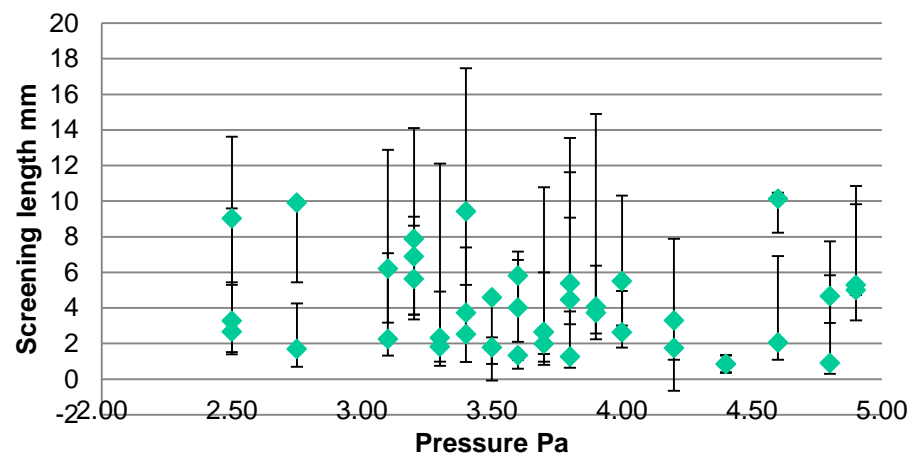




## Screening Length vs Power



## Screening Length vs Pressure



# Future Work

- Langmuir Probe measurements
- System-size dependence of thermal conductivity
- Mode-coupling instability
- Torsion investigation
- System-size dependence of dispersion relations
- Possible photophoretic force experiment





# Thank You



Knowledge for Tomorrow



# Laser Focus

